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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,084	10/14/2003	John Oskin	30451/94753	4333

23644 7590 06/30/2004

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EXAMINER	
WACHSMAN, HAL D	
ART UNIT	**PAPER NUMBER**
2857	

DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/685,084	**Applicant(s)** OSKIN ET AL.	
	Examiner Hal D Wachsman	**Art Unit** 2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1-14-04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The drawings are objected to because Figure 4 has solid black shading in part of the figure which is not permitted (37 CFR 1.84(m)). Appropriate correction is required.

2. The Abstract is objected to because it contains paragraph numbering ("[00033]") from the specification and contains purported merits (i.e. "..in a simple format…to quickly analyze production"). Appropriate correction is required.

3. The use of the trademarks Cycle Erosion and Access from Microsoft Corporation has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

4. The table at the top of page 6 of the specification has not been labeled as "TABLE II". Appropriate correction is required.

5. Claims 1-20 are objected to under 37 C.F.R. 1.75(a) for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. The preamble of claim 1 cites "A method for monitoring operational efficiency of **equipment in a**, the method comprising…" but "in a" what exactly is being referred to here ? Claim 1, line 3, cites "calculating an availability value" but an availability value for what exactly is being referred to here ? This same type of problem occurs in claim 1, lines 4, 5, 8, 9 as well as in various locations of claims 13-16. Claim 1, line 6, cites "defining an overall equipment effectiveness value" however is this referring to the same equipment already cited in the preamble of the claim ? This same type of problem also

occurs in claim 14, line 7, claim 15, line 4, claim 16, line 10. Claim 4, line 3, cites "a maximum planned production time" however is this the same maximum planned production time" already cited in claim 2 ? The preamble of claim 13 cites "...a method of monitoring operational efficiency.." but operational efficiency of what exactly is being referred to here ? Claim 14, line 3, cites "a module.." but exactly what type of module is being referred to here ? This same type of problem also occurs in claim 15, line 3, claim 16, line 5. Claim 15, lines 7-8, cite "each of the plurality of terminals" which it appears should be "each terminal of the plurality of terminals". Claim 15, lines 8-9, cite "each of the plurality of equipment" which it appears should be "each equipment of the plurality of equipment". The preamble of claim 16 cites "The system for the monitoring...." Which it appears should be "A system for monitoring...". Claim 17, lines 2-3, cite "each additional sensor" which it appears should be "each at least one additional sensor". Claim 19, line 3, cites "each additional terminal" which it appears should be "each at least one additional terminal". Claim 19, lines 3-4, cite "each additional equipment" which it appears should be "each at least one additional equipment". The examiner asks the applicant to better claim the limitations cited above. While the examiner understands the intentions of the applicant he feels confusion could be drawn from the limitations cited above. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 14 and 16-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 14 and 16 are hybrid claims, that is each is a single claim which claims both an apparatus and the method steps of using the apparatus. Claim 14 in the preamble of the claim first sets forth an apparatus "A system for monitoring…." followed by "a module.." at the beginning at the body of the claim. However, after that there are a series of method steps "calculates an availability value", "calculates a performance value", etc. which constitute the method steps of using the apparatus. The preamble of claim 16 first sets forth an apparatus "The system for the monitoring…" followed by at the beginning of the body of the claim "a sensor in reporting…" and "a module in electrical communication…" however this is followed by a series of method steps "use the data to calculate an availability value", "use the data to calculate a performance value", etc. which constitute the method steps of using the apparatus.

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim 14 is rejected under 35 U.S.C. 112, first paragraph, because the claim recites, solely, a single "means" ("a module..") as its function and thus is of undue breadth (see MPEP 2164.08(a) and In re Hyatt, 708 F.2d 712, 218 USPQ 195 (Fed. Cir. 1983)).

Claim Rejections - 35 USC § 101

10. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

11. Claims 1-14 and 16-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 1, 13 and 14, recite a series of mathematical steps with no clearly defined practical application of these steps or do not draw a conclusion as to the final end result of the mathematical operation being directed toward a practical application. These claims do not fall into either of the "safe harbors" defined in the Guidelines for Computer-Implemented Inventions in that there is no manipulation of measured data representing physical objects or activities to achieve a practical application (pre-computer process activity – data gathering) or the performance of independent physical acts (post-compute process activity). Thus, a mathematical problem is being solved here without limitation to a practical application in the claim. In addition, the preamble of claim 13 states "A computer-readable medium or modulated signal being encoded with computer-readable instructions to perform a method..." however as the computer-readable instructions are not being executed such as on a general purpose computer the functionality of the computer-readable medium or modulated signal is not being realized. With respect to claims 14 and 16, these are hybrid claims as already shown in paragraph 7 above, and thus are directed to neither a "process" or a "machine" but rather embrace or overlap two different statutory classes of

invention set forth in 35 U.S.C. 101 which was drafted so as to set forth the statutory classes of invention in the alternative only (see MPEP 2173.05(p).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 1-11, 13, 14, 16, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Managing overall equipment effectiveness [OEE] to optimize factory performance" (Pomorski) in view of "Manufacturing science in ion implantation" (Glawischnig).

As per claim 1, Pomorksi (page A-33) discloses “calculating an availability value”, “calculating a performance value”, “calculating a quality erosion value” and “defining an overall equipment effectiveness value as the product of the availability value, the performance value, and the quality erosion value”. Pomorski (page 1-34) discloses “calculating a performance loss value” and “calculating a quality loss value”. It appears though that Pomorski does not clearly disclose “displaying the overall equipment effectiveness value.....the quality loss value in a graphical format display.” However, Glawischnig (page 354, see at least figure 1) teaches this excepted feature. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because as taught by Glawischnig (page 354, section II. A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning. The stati of the equipment are usually segmented according to SEMI standards as seen in Figure 1 in Glawischnig.

As per claim 2, Glawischnig (page 354) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because as taught by Glawischnig (page 354, section II. A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning. The stati of the equipment are usually segmented according to SEMI standards as seen in Figure 1 in Glawischnig.

As per claim 3, Glawischnig (page 354) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because as taught by Glawischnig (page 354, section II. A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning. The stati of the equipment are usually segmented according to SEMI standards as seen in Figure 1 in Glawischnig.

As per claim 4, Glawischnig (page 354) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because as taught by Glawischnig (page 354, section II. A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning. The stati of the equipment are usually segmented according to SEMI standards as seen in Figure 1 in Glawischnig.

As per claim 5, Glawischnig (pages 354, 358) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because all the cited values cause downtime which results in decreased performance and productivity.

As per claim 6, Glawichnig (pages 354, 358) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because as taught by Glawischnig (page 354, section II. A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning. The stati of the equipment are usually segmented according to SEMI standards as seen in Figure 1 in Glawischnig.

As per claim 7, Glawichnig (pages 354, 358, 359) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because an operator can improve the overall equipment effectiveness value such as by taking a shorter break, expediting shift turnover, etc.

As per claim 8, Glawichnig (page 358) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because by reducing the duration of a break the downtime is also reduced.

As per claim 9, Glawichnig (pages 354, 358, 359) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because by reducing equipment setup time the downtime is also reduced.

As per claim 10, Glawichnig (pages 358, 359) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because by reducing delays due to shift transitions the downtime is also reduced.

As per claim 11, it is inherent in the art that rewards to employees, such as in this case an operator, provide added incentive to meet the desired performance goals.

As per claim 13, all the features in this claim have already been addressed in the rejection of claim 1 above.

As per claim 14, Pomorski (page A-35) discloses "a module.." and the remaining features of this claim have already been addressed in the rejection of claim 1 above.

As per claim 16, Pomorski (page A-35) discloses "the module operative to:" Pomorksi (page A-33) discloses "use the data to calculate an availability value", "use to data to calculate a performance value", "use the data to calculate a quality erosion value" and "define an overall equipment effectiveness value as the product of the availability value, the performance value, and the quality erosion value". Pomorski (page 1-34) discloses "calculate a performance loss value" and "calculate a quality loss value". It appears though that Pomorski does not clearly disclose the remaining features of this claim. However, Glawischnig (pages 354-356) teaches "a sensor in reporting communication....at least the up-time and down-time for the equipment; and a module in electrical communication with the sensor and receiving data from the sensor". Glawischnig (page 354, see at least figure 1) teaches "display the overall equipment effectiveness value....quality loss value in a graphical format display." It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because as taught by Glawischnig (page 354, section II. A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning. The stati of the equipment are usually segmented according to SEMI standards as seen in Figure 1 in Glawischnig.

As per claim 17, it is inherent in the art that each piece of equipment would need at least one or more sensors so as to gather the desired operating data of the equipment.

As per claim 20, Glawischnig (pages 355-357) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because as taught by Glawischnig (page 354, section II. A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning.

14. Claims 12, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Managing Overall Equipment Effectiveness [OEE] to Optimize Factory Performance" (Pomorski) in view of "Manufacturing Science in Ion Implantation" (Glawischnig) as applied to claims 7 and 16 above, and further in view of Wu et al. (6,256,550).

As per claim 12, Wu et al. (figures 2, 5-7, col. 7 lines 40-64) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Wu et al. to the inventions of Pomorski and Glawischnig as specified above because as taught by Glawischnig (page 358) in most practical cases, the operator or dispatcher of a production unit, like an implant center, can see the list with all the lots waiting for production and maybe on a different screen the stati of the available tools.

As per claim 18, Wu et al. (figures 2, 5-7, col. 7 lines 40-64) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Wu et al. to the inventions of Pomorski and Glawischnig as specified above because as taught by Glawischnig (page 358) in most practical cases, the operator or dispatcher of a production unit, like an implant center, can see the list with all the lots waiting for production and maybe on a different screen the stati of the available tools.

As per claim 19, Wu et al. (figures 2, 5-7, col. 7 lines 40-64) teaches the feature of this claim. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Wu et al. to the inventions of

Pomorski and Glawischnig as specified above because as taught by Glawischnig (page 358) in most practical cases, the operator or dispatcher of a production unit, like an implant center, can see the list with all the lots waiting for production and maybe on a different screen the stati of the available tools.

15. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over "Managing Overall Equipment Effectiveness [OEE] to Optimize Factory Performance" (Pomorski) in view of "Manufacturing Science in Ion Implantation" (Glawischnig) and Wu et al. (6,256,550).

As per claim 15, Pomorski (pages A-33 through A-35) discloses "a module that calculates an availability value, calculates a performance value…calculates a performance loss value, and calculates a quality loss value". It appears though that Pomorski does not clearly disclose the plurality of terminals as described in the last 5 lines of this claim. However, Glawischnig (page 354, see at least figure 1) teaches the "displaying at least the overall equipment effectiveness value, the performance loss value, and the quality loss value in a graphical format display". It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Glawischnig to the invention of Pomorski as specified above because as taught by Glawischnig (page 354, section II. A.) all semiconductor manufacturing sites use some kind of documentation of the actual equipment performance as a means for controlling and planning. The stati of the equipment are usually segmented according to SEMI standards as seen in Figure 1 in Glawischnig. It appears though that the combination of references still does not clearly disclose "a plurality of terminals in networked communication with the module, each of the plurality of terminals being positioned at an operator location for each of the plurality of equipment, each terminal having an output device for displaying". However, Wu et al. (figures 2, 5-7, col. 7 lines 40-64) teaches this excepted feature. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the techniques of Wu et al. to the inventions of Pomorski and Glawischnig as specified above because as taught by Glawischnig (page 358) in most practical cases, the operator or dispatcher of a production unit, like an implant center, can see the list with all the lots waiting for production and maybe on a different screen the stati of the available tools.

16. The following references are cited as being art of general interest: Martin (6,418,351) which discloses using OEE with signals automatically input from the tool itself, "Overall equipment effectiveness (OEE) and cost measurement [semiconductor manufacturing]" (Konopka et al.) which focuses on the TPM metric of OEE, "300 mm tool automation and its impact on fab design and OEE" (Weiss) which discloses pie charts with wedges for displaying OEE and "Uses and misuses of the 'overall equipment effectiveness' for production mangement" (S.E. Gouvea da Costa et al.) which disclose OEE and its components.

17. No claims are allowed.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hal D Wachsman whose telephone number is 571-272-

2225. The examiner can normally be reached on Monday to Friday 7:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc Hoff can be reached on 571-272-2216 The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hal D. Wachsman
Hal D Wachsman
Primary Examiner
Art Unit 2857

HW
June 26, 2004